

AMENDMENTS TO THE SPECIFICATION

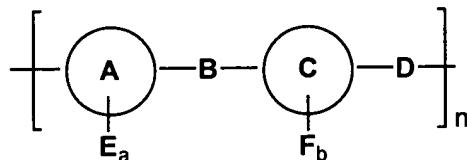
Just prior to the "Related Applications," please insert:

Statement Regarding Federally Sponsored Research or Development

This invention was made with the support under the following government contract: N00014-97-1-0174 awarded by the Office of Naval Research. The government has certain rights in the invention.

Just prior to page 11, line 19, please insert:

In some embodiments, an article of the present invention may comprise a nanoscopic pathway having a conductivity, an insulating dielectric surrounding the nanoscopic pathway, and a nanoscopic switch in electronic communication with the nanoscopic pathway being capable of altering the conductivity of the nanoscopic pathway. The nanoscopic pathway may comprise a conducting polymer, wherein the conducting polymer has a structure comprising the formula:

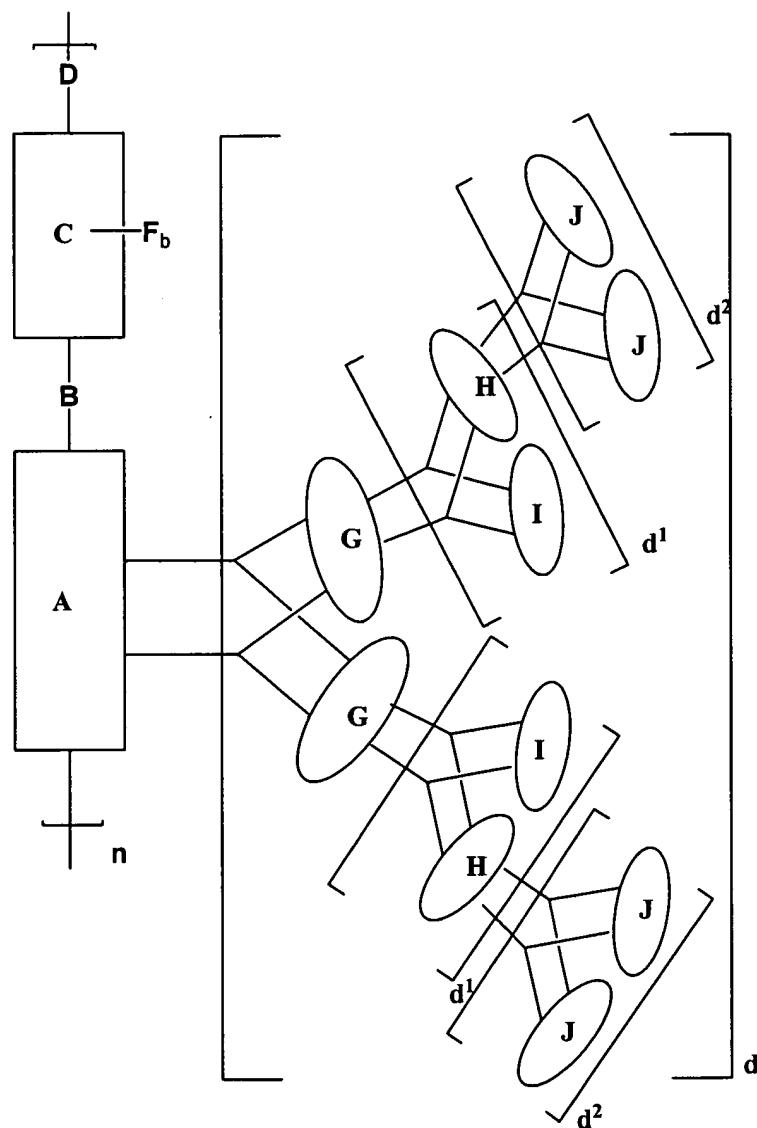


wherein A and C are aromatic groups; B and D can be a heteroatom or metal and chosen from a group of N, P, S, As, Se, or -CC-M-CC-(M=FeL_x, RuL_x, PdL_x, PtL_x, CoL_x, RhL_x, where L is neutral (phosphine, nitrogen, or π -arene based ligand) or charged (nitrogen, oxygen, or charged π -arene ligand), or are selected from the group consisting of a carbon-carbon double bond and a carbon-carbon triple bond; and any hydrogen on aromatic group A and C can be replaced by E and F respectively, wherein a and b are integers which can be the same or different and a = 0 - 4, b = 0 - 4 such that when a = 0, b is nonzero and when b = 0, a is nonzero, and at least one of E and F includes a bicyclic ring system having aromatic or non-aromatic groups optionally interrupted by O, S, NR¹ and CR¹₂ wherein R¹ is selected from the group consisting of hydrogen, C₁-C₂₀ alkyl, C₁-C₂₀ alkoxy

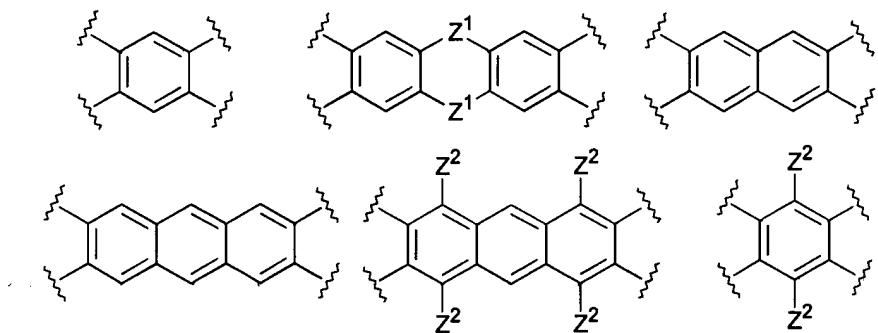
Amendment dated November 16, 2006
After Allowance Under 37 C.F.R. 1.312

and aryl and n is less than about 10,000, and wherein, when E or F is not said bicyclic ring system, E or F is a part of aromatic group A or C.

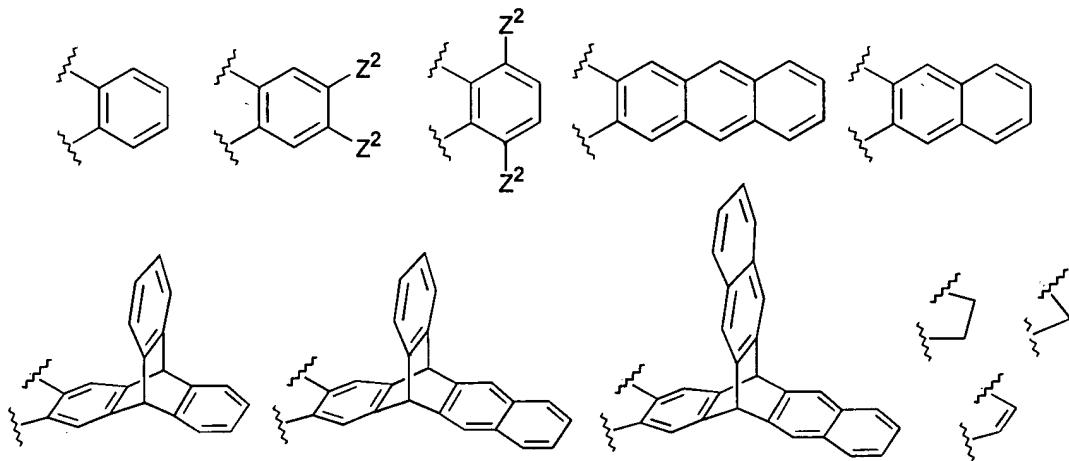
In some cases, E_a may be covalently attached to A, and the conducting polymer comprises the structure:



wherein G, H, I, and J are aromatic groups, d = 1, 2, and d¹ = 0, 1, such that when d¹ = 0, d² = 0 and when d¹ = 1, d² = 0, 1. In some embodiments, G and H may be the same or different, and each may be selected from the group consisting of:

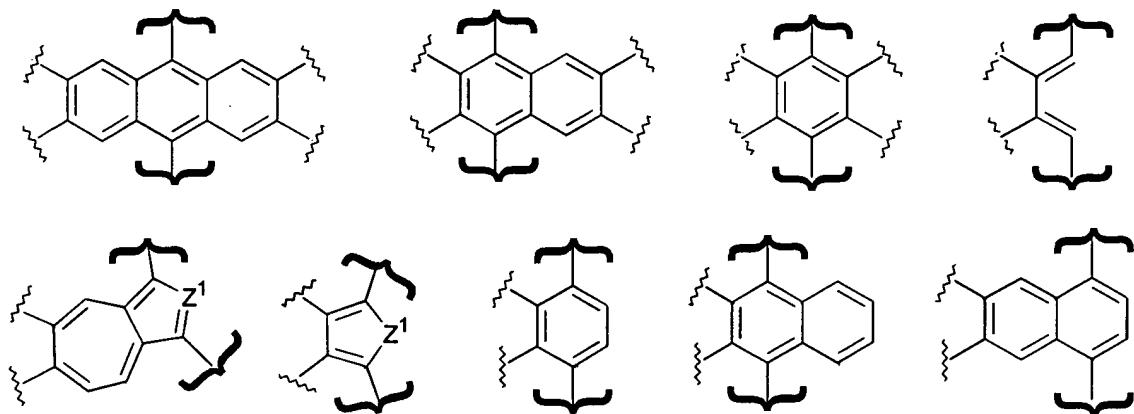


In some embodiments, I and J may be the same or different and each is selected from the group consisting of:

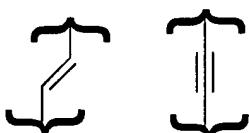


wherein any hydrogen in G, H, I and J can be substituted by R², R² is selected from the group consisting of C₁-C₂₀ alkyl, aryl, C₁-C₂₀ alkoxy, phenoxy, C₁-C₂₀ thioalkyl, thioaryl, C(O)OR³, N(R³)(R⁴), C(O)N(R³)(R⁴), F, Cl, Br, I, NO₂, CN, acyl, carboxylate, hydroxy, R³ and R⁴ can be the same or different and each is selected from the group consisting of hydrogen, C₁-C₂₀ alkyl, and aryl, Z¹ is selected from the group consisting of O, S and NR⁸ wherein R⁸ is selected from the group consisting of hydrogen, C₁-C₂₀ alkyl, and aryl, and Z² is selected from the group consisting of F, Cl, OR³, SR³, NR³R⁴ and SiR⁸R³R⁴.

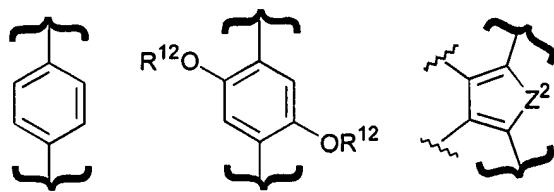
In some embodiments, A may be selected from the group consisting of:



wherein any hydrogen in A can be substituted by R⁵, R⁵ is selected from the group consisting of C₁-C₂₀ alkyl, aryl, C₁-C₂₀ alkoxy, phenoxy, C₁-C₂₀ thioalkyl, thioaryl, C(O)OR⁶, N(R⁶)(R⁷), C(O)N(R⁶)(R⁷), F, Cl, Br, NO₂, CN, acyl, carboxylate, hydroxy; R⁶ and R⁷ can be the same or different and each is selected from the group consisting of hydrogen, C₁-C₂₀ alkyl, and aryl; Z¹ is selected from the group consisting of O, S and NR⁸ and R⁸ is selected from the group consisting of hydrogen, C₁-C₂₀ alkyl, and aryl; B and D can be the same or different and each is selected from the group consisting of:

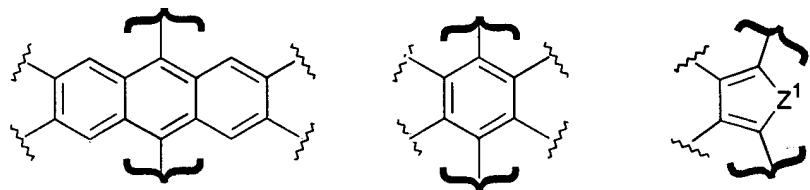


wherein any hydrogen in B and D can be substituted by R⁹, R⁹ is selected from the group consisting of C₁-C₂₀ alkyl, aryl, C₁-C₂₀ alkoxy, phenoxy, C₁-C₂₀ thioalkyl, thioaryl, C(O)OR¹⁰, N(R¹⁰)(R¹¹), C(O)N(R¹⁰)(R¹¹), F, Cl, Br, NO₂, CN, acyl, carboxylate, hydroxy, R¹⁰ and R¹¹ can be the same or different and each is selected from the group consisting of hydrogen, C₁-C₂₀ alkyl, and aryl; C may be selected from the aromatic group consisting of:



wherein R¹² is selected from the group consisting of hydrogen, C₁-C₂₀ alkyl and aryl; any hydrogen in C can be substituted by F which is represented by R¹³, R¹³ is selected from the group consisting of C₁-C₂₀ alkyl, aryl, C₁-C₂₀ alkoxy, phenoxy, C₁-C₂₀ thioalkyl, thioaryl, C(O)OR¹⁴, N(R¹⁴)(R¹⁵), C(O)N(R¹⁴)(R¹⁵), F, Cl, Br, NO₂, CN, acyl, carboxylate, hydroxy; R¹⁴ and R¹⁵ can be the same or different and each is selected from the group consisting of hydrogen, C₁-C₂₀ alkyl, and aryl; Z² is selected from the group consisting of O, S and NR¹⁶ and R¹⁶ is selected from the group consisting of hydrogen, C₁-C₂₀ alkyl, and aryl.

In one set of embodiments, A may be selected from the group consisting of:



and both B and D may be:

